REMARKS

Prior to examination, it is requested that the above changes be made. By this Amendment, claims 17-32 and 58-66 are canceled, and claims 76-98 are added. Pending claims 1-16, 33-57, and 67-75 differ from the patented claims of the parent application, U.S. Patent 6,336,833, with respect to the recitation of the hull and the steering nozzle and are intended to offer a different scope of coverage. The new claims 76-98 are supported by the original parent disclosure and are intended to provide additional claim coverage based on the originally disclosed invention. No changes to the application have been made by this Preliminary Amendment in response to any of the prior art cited in the parent or related applications. The changes to the Title, specification and abstract are made to correspond to the new set of claims presented in this application.

The specification is corrected to state that this application is a continuation rather than a continuation-in-part application. It is requested that the Patent Office records be updated to reflect this correction.

Paragraph **[0089]** is also corrected to accurately describe what a throttle position sensor measures, as would be readily recognized by one of ordinary skill in the art.

The Information Disclosure Statement (IDS) filed herewith cites two new prior art references that were cited in related co-pending application 09/904,742. The IDS also cites U.S. Patent 6,159,059 and U.S. Patent 6,231,410, which were both filed after the parent filing date of this application. As such, these references are not prior art to this application, but are cited herein to provide background information only. Consideration and acknowledgement of such consideration are requested.

Attached is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **"Version with markings to show changes made"**.

Applicants submit that the claims are patentable over the prior art and that the application is in condition for allowance. Prompt and favorable action on the merits of the claims is requested. Should further issues require resolution prior to allowance, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

Please delete the Title of the application as filed and replace it with the following new Title:

WATERCRAFT WITH STEER RESPONSIVE ENGINE SPEED CONTROLLER

IN THE SPECIFICATION:

The specification is changed as follows by amended the following paragraphs:

[0001] The present application claims priority to and is a continuation [continuation-in-part] of U.S. Application Serial No. 09/383,073, filed August 26, 1999, which in turn claims priority to U.S. Application 08/782,490, filed January 10, 1997, the entirety of each of which are hereby incorporated into the present application by reference.

[0024.01] -- An additional object of the invention is to provide a watercraft with a steer responsive engine speed controller that functions to increase engine speed based on steering signals regardless of manual throttle control.--

[0025] As embodied and broadly described herein, [the present] this invention seeks to provide a watercraft comprising[:

(A)] a hull, and

[(B)] a steerable propulsion unit driven by an internal combustion engine[, said unit] that is capable of generating thrust and capable of steering [said] the watercraft by directing [said] the thrust in a desired direction[;

(C) a]. A manual throttle control [for controlling a throttle of said] is provided to control the speed of the internal combustion engine, and [;

(D)] a manual steering control is provided for steering [said] the watercraft. An[; and

(E) a throttle] actuator responsive to [said] the manual steering control [for causing said] causes the steerable propulsion unit to generate a propulsive force at least equal to the minimum propulsive force necessary to effectively steer [said] the watercraft when [said] the manual steering control is turned in either direction beyond a predetermined angular threshold, whereby [to cause said] the watercraft [to] can remain maneuverable independently of the manual throttle control setting.

[0026] When the manual steering control is turned beyond a certain, predetermined angular threshold, the [throttle] actuator opens the throttle such that the propulsive force generated by the steerable propulsion unit is increased to a level corresponding to the minimal propulsive force needed to effectively steer the watercraft. This augmentation of propulsive force only occurs if the manual throttle control is set to produce a propulsive force less than the minimal propulsive force required for effectively steering the watercraft. Otherwise, if the manual throttle control is set to produce a thrust exceeding the minimal propulsive force required to effectively steer the watercraft, the [steer-responsive] throttle will remain open at the level set by the manual throttle control. Of course, if the manual throttle control is then reduced to below the threshold setting, the actuator causes the [steer-responsive] throttle [will] to remain open so as to produce the minimal propulsive force necessary to effectively steer the watercraft. Thus, whenever the manual steering control is turned beyond the angular threshold, the [steer-responsive throttle] actuator automatically ensures that the steerable propulsion unit generates the minimal propulsive force necessary for effectively steering the watercraft. Thus, the watercraft is maneuvered more easily since a turning thrust is automatically generated.

[0027] It is another object of the present invention to provide a watercraft with a steer--responsive [throttle] engine assembly controlled by an electronic control system.

[0028] As embodied and broadly described herein, the present invention seeks to provide a watercraft comprising[:

(A)] a hull, and [;

(B)] a steerable propulsion unit driven by an internal combustion engine[, said unit] that is capable of generating thrust and capable of steering [said] the watercraft by directing [said] the thrust in a desired direction. A [;

(C) a] manual throttle control is provided for controlling [said] the speed of the internal combustion engine, and [;

(D)] a manual steering control is provided for steering [said] the watercraft. An [;

(E) a throttle] actuator is provided that is responsive to a signal for causing the steerable propulsion unit to generate a propulsive force at least equal to the minimum propulsive force necessary to effectively steer [said] the watercraft for a given speed when [said] the manual steering control is turned in either direction beyond a predetermined angular threshold, [whereby to cause said] which causes the watercraft to remain maneuverable independently of the manual throttle control setting. The system also includes [;

(F)] a steer angle measuring device for generating a steer angle signal representative of the steer angle of [said] the steerable propulsion unit, [;

(G)] a speed measuring device for generating a speed signal representative of the speed of the watercraft, and an [;

(H) a throttle] actuator control circuit for generating an output signal for controlling [said throttle] the actuator. The [; said throttle] actuator control circuit has [having:

-] a first input for receiving [said] the steer angle signal, [;

-] a second input for receiving [said] the speed signal, [;] and

[-] an output signal generator for generating an output signal in response to signals received at [said] the first and second inputs. The [; said] output signal [being] is applied to [said throttle] the actuator for controlling [said throttle] the actuator.

[0029] This steer-responsive [throttle] engine assembly further incorporates an electronic control system that senses the steer angle of the manual steering control as well as the speed of the watercraft and then computes a [throttle] setting that corresponds to a propulsive force appropriate for steering the watercraft.

[0045] Figure 14 is a schematic depicting a second embodiment of the steer-responsive system [throttle] in accordance with the present invention, the engine speed [throttle] being controlled by a control system; and

[0051] Referring back to Figure 1, the steering angle of the steering nozzle 14 is controlled by a manual steering control such as a steering wheel 16 which actuates the steering nozzle 14 via a steering assembly 18 and a steering nozzle cable 19. [(]In the case of a personal watercraft, the manual steering control would be a pair of handlebars. In the case of a motorboat, the manual steering control would be either a steering wheel or tiller.[)] In any case, even the electronically controlled embodiments described below, turning the steering element causes a responsive steering movement to the propulsion device. In other words, turning the steering element generates a steering signal, which could be a mechanical, electronic or some other suitable signal.

[0089] The electronic control module 300 calculates the optimal throttle opening for effectively steering the watercraft based on the input signals from the steering sensor 310 and the speed sensor (pitot tube) 320. A throttle position sensor (TPS) 330 measures the actual position of the throttle [lever], which is essentially a measurement of how much the throttle is

open. The electronic control module generates an output signal that activates a throttle actuator only when the measured throttle setting is less than the desired throttle setting for a given speed and steer angle. In other words, the output signal is only generated if the signal from the manual throttle control corresponds to a throttle setting that will produce a thrust less than what is needed to steer the watercraft. The throttle actuator opens and closes the throttle so as to optimize the thrust for steering. In the preferred embodiment, the control module will increase the opening of the throttle as the watercraft speed increases in a non-linear fashion. For the purposes of illustration only, the throttle may be set so that the engine idles at 2000 RPM for a speed of zero knots. For a speed of 10 knots, the throttle may be opened so that the engine runs at 2600 RPM. For a speed of 20 knots, the throttle may be opened to produce an engine speed of 2900 RPM. The optimal throttle setting can be determined empirically by measuring the thrust needed to effectively steer the watercraft and by correlating that thrust to the impeller's speed of rotation, the engine RPM, and the throttle setting. of course, the thrust needed to effectively steer the watercraft depends on the size and type of watercraft.

IN THE CLAIMS:

Claims 17-32 and 58-66 are canceled without prejudice or disclaimer, and new claims 76-98 are added.

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